REMARKS

By the present amendment, claims 10-20 are pending in the application.

Advisory Action

The Advisory Action mailed July 15, 2004 at page 2, "Continuation of 2. NOTE:" stated that it is suggested Applicant amend the claims to read on "consisting of" language which will preclude the use of Sorathia's additional components.

By the present amendment, independent claim 10, the only independent claim, has been amended to use the claim language --consisting of--.

In view of the Advisory Action mailed July 15, 2004, it is submitted that amended independent claim 10, and claims 11-20 dependent thereon, are patentable over the prior art.

It is therefore submitted that entry of the present amendment under Rule 116 is appropriate.

Double Patenting

Claims 10-20 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of co-pending Application No. 10/031,822.

An Express Abandonment was filed in Application No. 10/031,822 by Certificate of Mailing dated September 21, 2004.

It is therefore submitted that the provisional obviousness-type double patenting rejection of claims 10-20 over claims 1-11 of Application No. 10/031,822 is now moot.

It is therefore respectfully requested that the provisional obviousness-type double patenting rejection be withdrawn.

§102

Claims 10 to 20 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,236,773 to Sorathia et al.

This rejection is respectfully traversed.

Patentability

The Office Action equates the plasma spraying of Sorathia with the flame spraying of the present invention. Applicants maintain that plasma spraying and flame spraying are different technologies which cannot be equated.

Plasma spraying means adhesion wherein refractory powder is injected in the plasma arc.

Flame spraying means adhesion wherein refractory is injected and melted in a flame composed of LPG and oxygen.

All arguments of the present amendment are directed to flame spraying.

Independent claim 10 has been amended by changing "comprising" to --consisting of--. The present invention does not use the organic resin of Sorathia which is an

essential feature of Sorathia's technology. The present invention is very different from Sorathia.

Sorathia et al. relates to a fire-resistant barriers for composite materials, and the main-feature of the multiple layer construction resides in the construction (A) a multilayer fire-resistant barrier material over (B) a fiber-reinforced plastic composite material substrate. (A) the multilayer fire-resistant barrier material is comprised of (a) a first bond coating layer, (b) an intermediate ceramic coating layer, and (c) an outer intumescent coating layer, and (B) the fiber-reinforced plastic composite material substrate is composed of a first coating layer comprising a plastics (such as polyesters, epoxy resins, phenolic resins, bismaleimides and polyphenolic sulfides) reinforced by fibers (such as glass fiber, carbon fiber, Kevlar fiber, and Spectra fiber) (See col. 2, lines 13-17).

The first bond coating layer (a) comprises zinc being from about 2 - about 3 mils thick. The ceramic layer (b) comprises zirconia stabilized with approximately 7-8% yttria, the yttria stabilized zironic being from about 3 - about 10 mils thick.

The intumescent coating layer (c) is from about 10 - about 40 mils thick.

On the other hand, an important feature of the present invention resides in a highly endurable heat insulating material which comprises providing on a surface

layer of inorganic heat insulating fibers a flame sprayed film of a fire-resistant ceramic substance through the medium of a coating film of a surface hardening material.

The fibers as a first layer (base layer) are alumina-silica substance, refractory clay, zirconia, mullite, zircon, magnesia, calcia, dolomite, corundum, bauxite, alumstone, silicon carbide, chromite, etc., and the surface of the fibers is coated with a surface hardening material (such as alumina-silica substance, refractory clay, zirconia, mullite, zircon, magnesia, calcia, dolomite, corundum, bauxite, alumstone, silicon carbide, chromite, etc) which has similar hot-temperature property, and the most outer layer is flame sprayed with refractory ceramic powder.

The differences between both materials are as follows: as the first layer, it is fibers in the present invention, whereas the organic resin is necessary as a binder in Sorathia et al. As the intermediate layer, the material of Sorathia et al. has a coated layer worked by plasma sprayed or usual sprayed with zirconia. On the contrary, the feature of the surface hardening material in the present invention (page 15, line 29, page 16, line 31) is different from the material of Sorathia et al. which discloses only zirconia. As shown on page 15, line 3, in the present invention, the first layer of fibers is not coated by flame spraying, but the necessity of the surface hardening is for a liquid and or pasty state being capable of being permeable

into the interior of the fiber layer (see page 17, lines 1-4), and the surface hardening material and flame sprayed film of the refractory ceramics preferable have a similar hot-temperature property (see page 10, lines 23-26).

That is, the surface hardening material in accordance with the present invention has functions that it permeates into the fiber layer, increases adhesiveness by forming the composite layer with the fiber and the surface hardening agent protects the inorganic heat insulating fibers from high temperature flame during the flame spraying and prevents cracks on the flame sprayed layer after cooling.

On the other hand, a construction component of the most outer layer of Sorathia et al. is formed by usually coating the expanded layer (see col. 4, lines 49-50). On the contrary, the "refractory ceramics" in accordance with the present invention is preferably made by flame spraying, and the material has a similar hot-temperature property to that of the surface hardening material.

Further, the plasma spraying is a method for coating with refractory powders in the plasma arc, while the flame spraying is a method for coating with refractory powders in a flame composed of LPG and oxygen, so both are quite different each other.

It is therefore submitted that independent claim 10, and claims 11-20 dependent thereon, are patentable over Sorathia et al.

Sorathia does not disclose or suggest the specific method steps of dependent claim 14. Sorathia uses an organic resin and plasma arc spraying. The present invention coats with a surface hardening material and then flame sprays. Therefore, dependent claim 14 is further patentable.

With regard to dependent claims 15, 16 and 17, the furnace, smoke discharging device or tunnel are not statements of intended use. Dependent claims 15, 16 and 17 per se claim a furnace, a smoke discharging device or a tunnel. Therefore, dependent claims 15, 16 and 17 are further patentable.

Sorathia does not disclose or suggest the specific method steps of dependent claims 17-20. Therefore, dependent claims 17-20 are further patentable.

CONCLUSION

It is submitted that in view of the present amendment and foregoing remarks, the application is now in condition for allowance. It is therefore respectfully requested that the present amendment be entered and the application, as amended, be allowed and passed for issue.

Respectfully submitted,

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